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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/743,113	12/22/2003	Kyung Yun Jung	20061/OF03P220US	8491
34431	7590	08/05/2005	EXAMINER	
HANLEY, FLIGHT & ZIMMERMAN, LLC 20 N. WACKER DRIVE SUITE 4220 CHICAGO, IL 60606			MONDT, JOHANNES P	
			ART UNIT	PAPER NUMBER
			2826	

DATE MAILED: 08/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

SP

**Office Action Summary**

Application No.

10/743,113

Applicant(s)

JUNG, KYUNG YUN

Examiner

Johannes P. Mondt

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-3 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 December 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## **DETAILED ACTION**

### ***Response to Amendment***

Amendment filed 5/31/05 forms the basis of this office action. In said Amendment Applicant substantially amended claims 1-3. Comments on Remarks in said Amendment are included below under "Response to Arguments".

### ***Specification***

1. The incorporation of essential material in the specification by reference to an unpublished U.S. application, foreign application or patent, or to a publication is improper. Applicant is required to amend the disclosure to include the material incorporated by reference, if the material is relied upon to overcome any objection, rejection, or other requirement imposed by the Office. The amendment must be accompanied by a statement executed by the applicant, or a practitioner representing the applicant, stating that the material being inserted is the material previously incorporated by reference and that the amendment contains no new matter. 37 CFR 1.57(f).

### ***Drawings***

2. The drawings are objected to under 37 CFR 1.83(a) because they fail to show the claimed "semiconductor substrate" (line 3 of claim 1 but not shown, [0018]) as described in the specification. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended

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replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Objections***

3. ***Claim 3*** is objected to because of the following informalities: the wording "the first and second metal layers" should be replaced by "first and second metal layers".

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States

only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. **Claims 1 and 3** are rejected under 35 U.S.C. 102(e) as being anticipated by Lehmann et al (US 2004/0217441 A1). Lehmann et al teach (Figure 4) a semiconductor device ([0054]) comprising: a capacitor having a bottom electrode 225 ([0076]), a dielectric layer 224 (anti-fuse layer is a dielectric: see [0080]) and an upper electrode 221([0080]) formed on a semiconductor substrate 201 ([0078]);

a first insulating layer 203 ([0078]) formed on the semiconductor substrate 201 to cover the capacitor (Figure 4);

a plurality of first contact plugs 241 and 247 being electrically connected to either the bottom electrode (247 being connected to 225) or upper electrode (241 being connected to 242) ([0077] and [0082]);

a first metal wiring 205 ([0078]) (right side portion of 205 in Figure 4) formed on the first insulating layer and connected to the upper electrode through one of the first contact plugs (namely: through 247);

a second contact plug 205 (left side portion in Figure 4) formed on the first insulating layer and connected to the upper electrode through another one of the first contact plugs (namely: through 241) (loc.cit.);

a second insulating layer 207 ([0078]) formed on the first insulating layer to cover the first metal wiring and the second contact plug;

an anti-fuse 226 ([0081]) formed in a certain thickness (an anti-fuse without thickness is impossible because thickness is required in the dielectric phase) in a second via hole (as 226 is surrounded by 205 material it inherently is positioned in a

hole; said hole is a via hole because of its ability to conduct electricity in one of the phases of the anti-fuse) of the second insulating layer and electrically connected to the second contact plug (abutting it; Figure 4);

a third contact plug 261 ([0083]) filling the second via hole on the anti-fuse; and  
a second metal wiring 227 ([0085]) formed on the second insulating layer and electrically connected to the third contact plug.

*On claim 3:* The device of claim 1 would necessarily have to be formed in order to function. Claim 3 fails to further limit the device of claim 1 other than simply form each of their components.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. **Claim 2** is rejected under 35 U.S.C. 103(a) as being unpatentable over Lehmann et al (US 2004/0217441 A1) in view of Knall et al (US 2002/0088998 A1). As detailed above, claim 1 is unpatentable over Lehmann et al. Lehmann et al do not necessarily teach the further limitation defined by claim 2. However, it would have been obvious to include said further limitation in view of Knall et al, who, in a patent on memory arrays comprising metal wirings 16 and 18 separated by anti-fuse 20, hence an obvious application of the invention by Lehmann et al drawn to "semiconductor integrated circuits" with "various metal layers" ([0002] in Lehmann et al) teach the first and second

metal wirings to run perpendicular ([0005]). *Motivation* to include the teaching by Knall et al in this regard is that minimization of the pitch of the metal wiring arrays in each of two independent directions in the plane is found for a rectangular array, thus minimizing the required real estate for a given number of memory cells.

### ***Response to Arguments***

8. Applicant's arguments filed 5/31/05 have been fully considered but they are not persuasive. In particular, although the amendment to the claims has successfully overcome the rejections of claims 1-3 under 35 U.S.C. 112, first and second paragraphs through substantial amendment of claim 1, lines 5-7 and claim 3, lines 10-12, and examiner accepts the explanation of Applicant on the forming of anti-fuses and third contact plugs by planarizing the first and second metal layers, art rejections now possible for the first time as a result of the current definite claim language are herewith presented at the earliest time possible.

### ***Conclusion***

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Johannes P. Mondt whose telephone number is 571-272-1919. The examiner can normally be reached on 8:00 - 18:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan J. Flynn can be reached on 571-272-1915. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JPM  
July 27, 2005

  
**EVAN PERT**  
**PRIMARY EXAMINER**